

M. Dunn

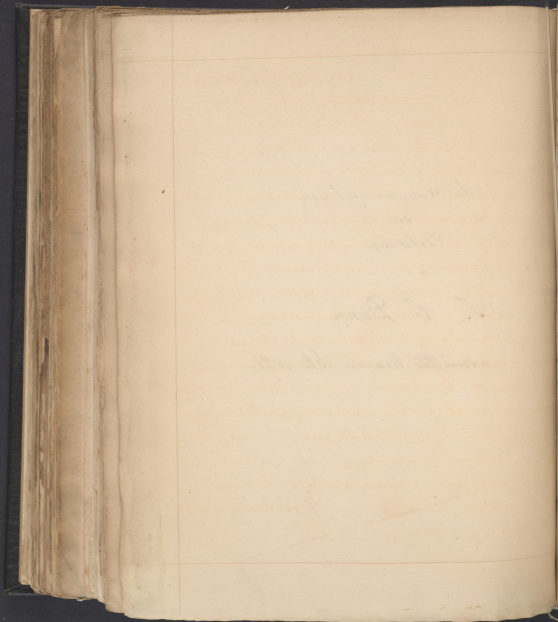
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An Inaugural Essay  
on  
Tetanus.

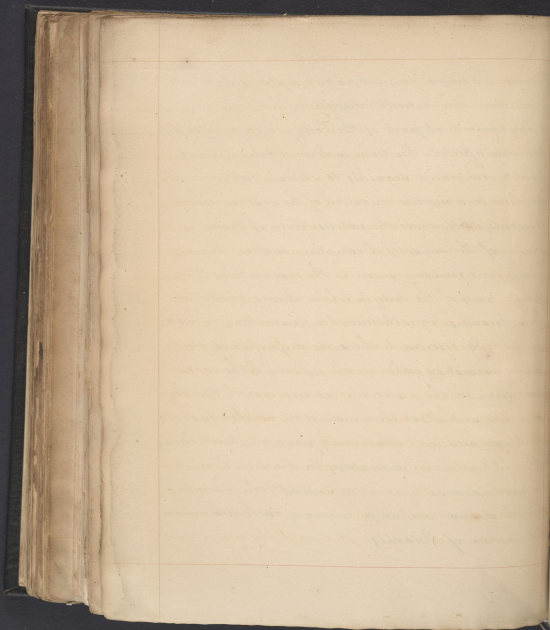
T. C. Dunn

admitted March 16th 1821.



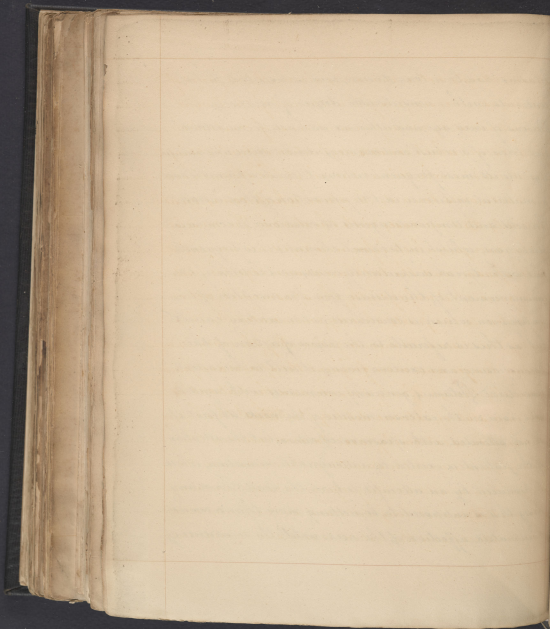
## *On Tetanus*

Tetanus is a name now generally adopted to designate a peculiar constitutional disease, without reference to any individual part of the body, which may be particularly affected. The term is derived from a greek word *τετνω* which signifies to stretch, and is correctly applied to a morbid condition of the system which presents itself under the exterior form of tension or spasm of the muscles of voluntary motion. Various names were formerly given to the disease from the different parts of the body in which it was developed. Thus Trismus, Crispithotonos, Emprosthotonos, Plurosthotonos &c referred to the same kind of spasmodic action, as existing either in the muscles of the neck & lower jaw, in the posterior or anterior part of the body, or in the side. But these distinctions neither connected with any peculiar pathological principles, nor relating to any particular indications in practice, have been almost universally rejected; and all the varieties of the disease are now properly included under the name of Tetanus.

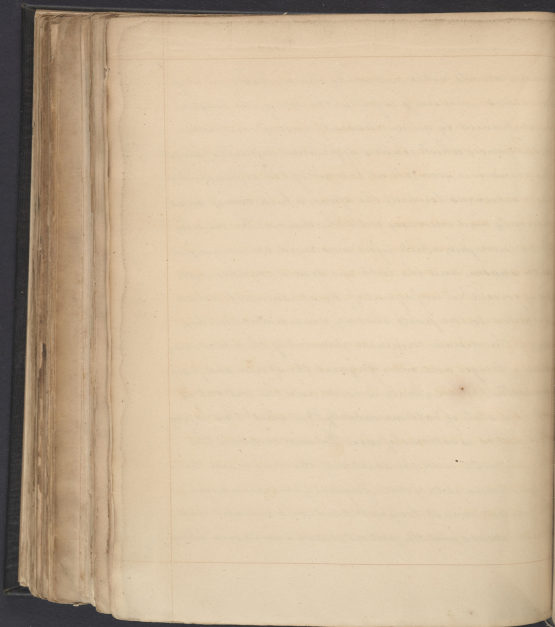




Tetanus has been long known, and is described by the  
antients, with a considerable degree of accuracy.  
Persons of every age and either sex are liable to its attack,  
but those of a robust and vigorous constitution, and mature  
age are its most frequent victims. Climate appears to have  
a material influence in the production of this disease.  
In cold and temperate regions its occurrence is compara-  
tively rare, whilst in tropical climates it is frequently  
met with. Great irregularity occurs in the time of the  
commencement of the disease from the reception of the  
impression which is considered as the exciting cause,  
but as this is referable to the degree of action of the  
predisposing and exciting causes, it will be hereafter  
considered. Tetanus generally commences with rigidity  
and pain in the extensor muscles of the neck. At first it  
is not attended with spasmodic action, but the attention  
of the patient is excited by a disagreeable sensation, which  
is produced by an attempt to turn the head. In many  
cases this is supposed to be nothing more than a common  
rhumatick affection of the neck: untill the recurrence of



spasm, attracts notice and excites alarm. At this period of the disease uneasiness is felt at the root of the tongue, accompanied by an unpleasant sense of constriction of the fauces, which renders deglutition difficult & painful. Severe pain is soon felt at the pit of the stomach, shooting backwards towards the spine, which comes on at intervals and increases with the disease. The muscles of the lower jaw, which before were rigid, are now seized with spasm, and the teeth are drawn together with great force. Not unfrequently the spasmodick action is limited to the parts already enumerated. In this case if the disease terminate favourably, the intermissions become longer and more frequent, the spasm and pain gradually, though slowly, subside, and the patient is left in a state of extreme debility. But alas! this happy termination is extremely rare. In most instances the pain augments with the duration of the disease, and the spasms return with greater frequency and increased force. The system cannot long withstand such repeated and forcible attacks, and the patient is soon seen to sink appa-



sently, from excessive irritation. Where the extent of the disease is increased, the progress and termination are somewhat different. The muscles of the back soon take on spasmodic action, the belly is retracted and feels firm & hard and the whole trunk is rigidly extended. The lower extremities are next affected, sometimes the flexors of the leg and thigh are contracted, and the knees are drawn up to the body, but their action is generally balanced by the extensors, and the trunk and inferior extremities are extended and rigid. Soon the whole system of voluntary muscles acquires more or less tetanic rigidity. The face is often violently distorted and the countenance exhibiting the most ghastly grinning, and the tongue is often thrust out violently between the teeth. When the spasm has thus become universal the patient commonly expires in convulsions. This disease throughout its whole course is attended with great pain which is proportioned to the duration and violence of the spasm. The muscular action generally lasts two, or three minutes, when it ceases and returns again in the course of ten or fifteen minutes.

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Death occurs at very different periods in this disease according to the severity of the attack. It sometimes takes place on the first, second, or third day, though frequently life is prolonged till the tenth or later. Dr Parry has remarked that if in an adult the pulse by the fourth or fifth day does not reach 100 or perhaps 110 in a minute, he believes the patient almost always recovers; if on the contrary, the pulse is 120 or more the case is generally fatal.

Notwithstanding the extreme violence of this disease, the arterial system is generally but little affected. In perhaps the majority of cases the pulse continues natural, and there occurs little derangement of the assimilating functions. The brain appears seldom to suffer in Tetanus, the mental powers remaining unimpaired, and sensibility exists untill death. Few discoveries of the effects of the disease have been made on examination after death.

The nervous system however has often exhibited traces of inflammation. Portions of nerves supplying the muscles most affected have displayed the effects of irritation; dark purple spots have also been observed in





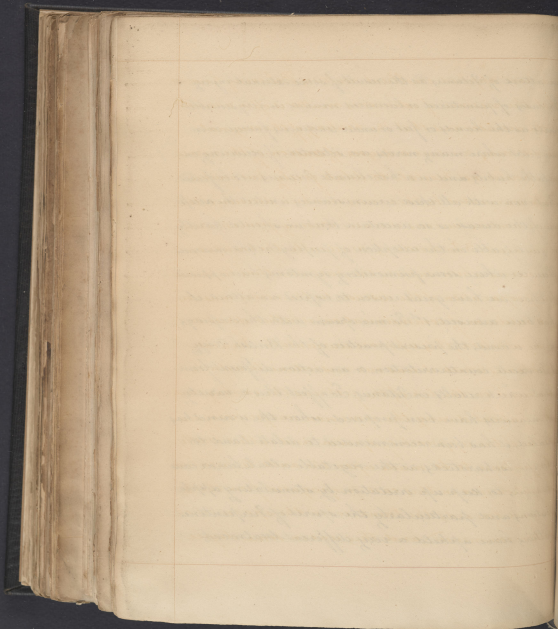
in different parts. The whole of the medulla spinalis in some cases has exhibited these effects in a greater or less degree. The blood has sometimes been found not coagulated but fluid like molasses.

A great variety of causes has been supposed to produce a disposition in the system favourable to Tetanick actions. The vicissitudes of heat and cold, fatigue, repletion and inanition, debility of the stomach and intestines and many circumstances of a like nature no doubt have their influence. But from many facts we are inclined to believe that without a peculiar constitutional irritability, all these would be inefficient. We are therefore inclined to transfer them from the list of predisposing causes to the exciting. The existence of a predisposition to specific disease is unquestionable. And in Tetanus we believe that ordinary irritants excite an action of which particular constitutions alone are susceptible. This disease is most prevalent in southern climates where sudden transitions from heat to cold are not so common as they are with us; but in these countries the constitution is much more variable.

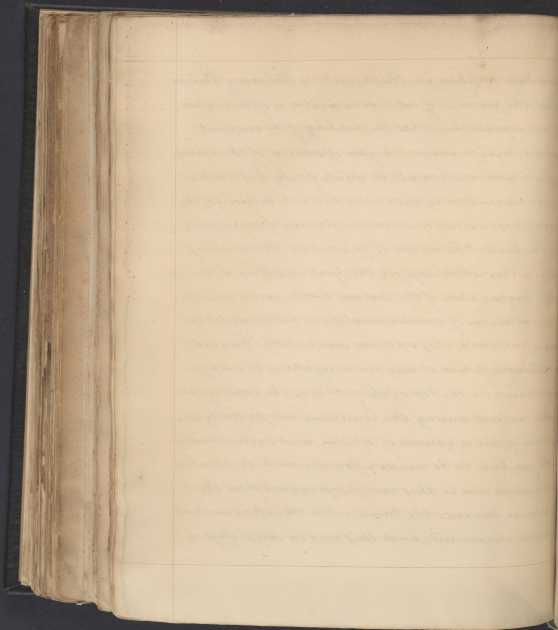


The nervous system of negroes who are more liable to this disease than whites is also peculiarly excitable. We see daily instances of particular nervous irritability; one man cannot endure a cat, another's teeth are set on edge by touching velvet, while a third when the bagpipe sings in the nose cannot contain his urine? Why should not the nerves of one individual be as susceptible of tetanick action, as the ear of a musician is of harmony, or the eye of a painter of proportion. Cases continually occur in which without any apparent cause the slightest irritant produces Tetanus, when in others the most extensive lacerations are unattended with spasm. May not Tetanus in irritable subjects be induced by those injuries from amputation which in ordinary constitutions produce only spasms of the stumps?

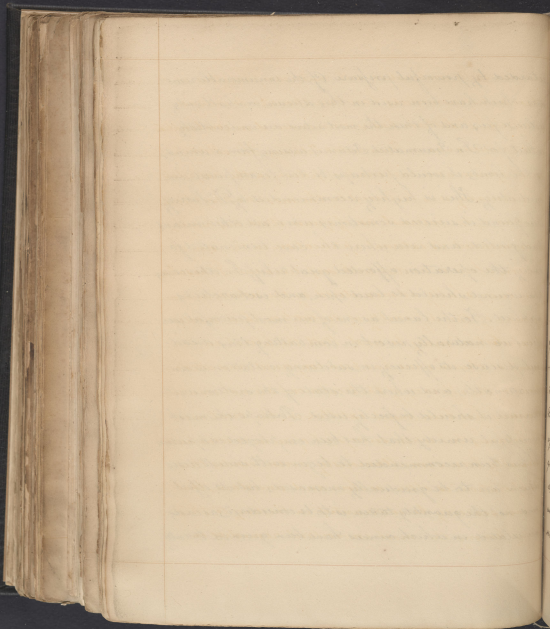
We shall divide the treatment into prophylactick or preventative, and that which is to be resorted to when the disease has appeared. The former must unavoidably be restricted in a great measure to those cases in which from peculiar circumstances we should anticipate



an attack of Tetanus as the result of some external injury.  
In cases of punctured or lacerated wounds in very sensible  
parts as the hands or feet or under tendinous fasciae, or in  
any part where many nerves are situated, if occurring in  
contagible habits and in a hot climate Tetanus is to be feared.  
But even with all these circumstances united the acce-  
sion of the disease is so uncertain that we should hardly  
be justifiable in the adoption of prophylactic measures.  
However where some premonitory symptoms have appeared  
or where we have great reason to expect an attack it  
has been advised, 1<sup>st</sup> To mix opium with the dressings  
of the wound, the present practice of the British Navy,  
2 To excite counterirritation, or an action different from  
that which results in Tetanus. To effect this a variety  
of measures have been proposed; where the wound has  
healed, it has been recommended to debilitate it and to  
apply escharotics, as the vegetable alkali, lunar caustic,  
fus, to keep up irritation by stimulating applica-  
tions and particularly the spirit of Turpentine.  
Others have upheld a very different treatment.

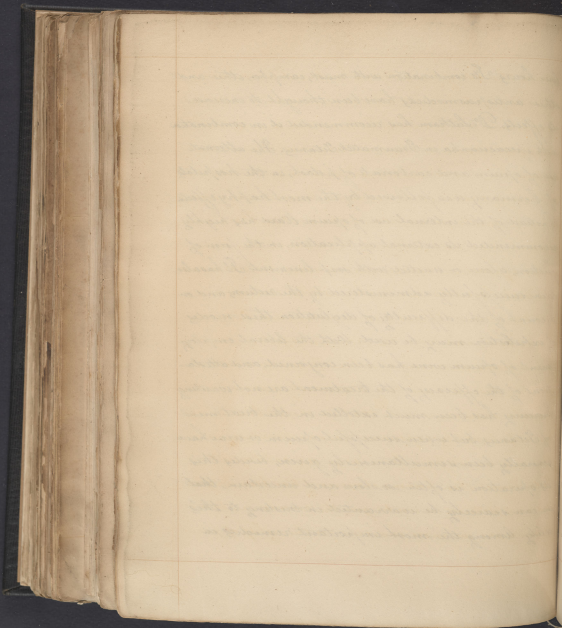


and have applied emollient poultices. Believing however that the presence of extraneous matter is often a cause of the diseases and that the healing of the original wound, may produce a degree of tension of the nerves we should not hesitate to, debate freely. This practice seems warranted by, those cases in which division of the scalp removes nervous diseases arising from injuries of the head. 3 To divide if practicable the trunks of the nerves which supply the part, and thus to prevent the propagation of the disease: as the nerves must be the medium of communication whether direct or sympathetical, this appears warrantable. In a case of Tetanus which it was our misfortune to witness, a wound on the top of the foot was the exciting cause. The patient during the remission was perfectly sensible of the approach of spasm, and called loudly for pressure to be made upon the ankle. A peculiar sensation was in this case propagated from the wound towards the trunk, when the spasmodick action commenced, and this was in some degree





retarded by powerful pressure. Of the innumerable remedies which have been used in this disease we shall only notice a few, and of these the most active are undoubtedly collected for. In Traumatick Tetanus arising from a wound of the limbs it would perhaps be best to amputate immediately. This is highly recommended by D. Larrey, who found it succeed sometimes when all other means had failed; and even where the case terminated fatally, the operation afforded great relief. In other cases the wound should be laid open, and escharoticks applied. To the lancet as one of our most powerful weapons we naturally resort in combatting this dreadful disease, its efficacy in subduing irritation is unquestionable, and where the state of the system will permit it should be freely used. Perhaps the most successful remedy that has been employed is opium. It has been recommended to begin with small doses which are to be gradually increased, but its effect and not the quantity taken is to be considered, as cases are related in which ounces have been given in twenty.



four hours. Its combination with musk, camphor, ether and  
other antispasmodicks have been thought to increase  
its effects. Dr Latham has recommended it in combination  
with ipecacuanha in Traumatic Tetanus. The alternate  
use of opium and carbonate of potash, in the hospitals  
of Germany was followed by the most happy effects.  
Instead of the internal use of opium Ward has highly  
recommended its external application, in the form of  
friction, alone or united with soap liniment. It has also  
been successfully administered by the rectum, and on  
account of the difficulty of deglutition these modes  
of exhibition may be used. With the liberal employ-  
ment of opium wine has been conjoined, and attes-  
tations of the efficacy of the treatment are not wanting.  
Mercury has been much extolled in the treatment  
of Tetanus but when successful opium or wine have  
generally been simultaneously given, besides this  
its operation is often so slow and uncertain, that  
we can scarcely be warranted in trusting to this  
ably. Among the most important remedies in



Notwithstanding the use of purgatives should not be overlooked  
constipation is generally attendant on this disease, and its treat-  
ment should be commenced by the employment of these  
medicines. Tobacco has by some been prescribed with ad-  
vantage, but it is too unmanageable, and its effects are so  
depressing that it could not safely be used long enough  
to make much impression on the system. Bark and  
arsenick may with propriety be employed, from their  
known efficacy in paroxysmal diseases. The warm and  
cold bath have both been highly extolled commencing  
with the former. It has been recommended to try the  
Prufic acid, and from the powerful effects of this ar-  
ticle it seems deserving of notice. So many remedies  
for this disease have been strenuously advocated, that  
it would seem impossible that we should be at a loss;  
but unfortunately experience has sanctioned so few,  
that it is unnecessary to enlarge our catalogue.  
In the lancet then how much soever it has been neg-  
lected and despised we would give the precedence to no  
remedy are we more indebted for the relief of pain

X



and the removal of morbid irritability. In a disease  
evidently inflammatory why should we be debarred  
from our most efficient resource. The known effect of ven-  
section in preparing the system for the operation of other  
remedies is not the least powerful argument for its use.  
Is it not after the morbid action has been subdued by  
bloodletting, that we are to substitute that of opium  
vinifre. The evacuation of the bowels and stomach by  
glysters and purgatives is next to be procured. Unques-  
tionably it is now that we are to anticipate the most suc-  
cessful results from the operation of opium. To the dose we  
can scarcely assign a limit; we should give it till a de-  
cided effect is produced upon the system, keeping the  
patient almost in a state of stupor. It has been urged  
against the employment of opium, that few patients  
recover under its use. But we would ask, where are we  
to find a substitute? To what remedy is our confidence  
equally due? To nothing but the most rational patho-  
logy supported by ample experience would we  
reign the only foundation on which we can stay





our hopes. As more testimony appears in favour of wine  
than of any other ally it should undoubtedly receive  
our confidence. After the violence of the disease is in some  
degree abated, tonics should be employed. Bark, arsenic  
and the vegetable bitters certainly claim our preference.  
Among this class of remedies the cold bath stands conspicuous.  
The permanent effect of affusion in interrupting morbid con-  
catenations of action deserves our notice. As the patient is liable  
to relapse every attention should be paid to the state of the  
system, and he should be supported by nourishing diet.  
It seems it is to be feared will long remain an opprobrium  
to our science. There is hardly a disease whose pathology  
is so imperfectly ascertained, and whose treatment is so  
unsatisfactorily defined. In this dilemma nothing remains  
but the faithful employment of all our resources, and the  
most powerful weapons should in succession be opposed to  
so formidable an enemy. Then though every effort should  
prove unavailing, we shall at least have the melan-  
choly satisfaction of having done our duty.



Thomas Schmitt

Thomas

admitted Aug 3 24 1892

